

## CLAIMS

What is claimed is:

1. A structure comprising:

a polycrystalline material comprising crystallites of polymers with interstitial regions therebetween;

*Wherein said*

*polymers selected from the group consisting of a precursor to an electrically conductive polymer and an electrically conductive polymer;*

*said interstitial regions between said crystallites comprising amorphous material comprising an additive;*

*said additive provides mobility to said polymer to allow said polymer to associate with one another to achieve said crystallites.*

2. A structure according to claim 1, wherein said structure is electrically conductive and has an isotropic electrical conductivity.

3. A structure according to claim 1, wherein said additive is ~~selected from the group consisting of plasticizers and diluents~~

*plasticized*

4. A structure according to claim 1, wherein said additive is a plasticizer selected from the group consisting of:

Adipic acid derivatives	Sebacic acid derivatives
Azelaic acid derivatives	Stearic acid derivatives
Benzoic acid derivatives	Succinic acid derivatives
Citric acid derivatives	Sulfonic acid derivative
Dimer acid derivatives	Terpenes
Epoxy derivatives	Terpentine derivatives
Fumaric acid derivatives	Siloxanes
Glycerol derivatives	Polysiloxanes
Isobutyrate derivatives	Ethylene glycols
Isophthalic acid derivatives	Polyethylene glycols
Lauric acid derivatives	Polyesters
Linoleic acid derivative	Sucrose derivatives
Maleic acid derivative	Tartaric acid derivative
Mellitates	Terephthalic acid derivative
Myristic acid derivatives	Trimellitic acid derivatives
Oleic acid derivatives	Glycol derivatives
Palmitic acid derivatives	Glycolates
Paraffin derivatives	Hydrocarbons
Phosphoric acid derivatives	Phosphonic acid derivatives
Phthalic acid derivatives	Polysilanes
Ricinoleic acid derivatives	

5. A structure according to claim 1, wherein said polymer is selected from the group consisting of substituted and unsubstituted polyparaphenylenes, polyparaphenylenes, polyanilines, polythiophenes, polyazines, polyfuranes, polypyroles, polyselenophenes, poly-p-phenylene sulfides, polyacetylenes formed

from soluble precursors, combinations thereof and blends thereof with other polymers and copolymers of the monomers thereof.

6. A structure according to claim 1, wherein said structure has crystallinity greater than about 25%.

7. A structure comprising:

a polycrystalline material comprising crystallites of polymers with interstitial regions therebetween;

said polymer is selected from the group consisting of a precursors to an electrically conductive polymer and an electrically conductive polymer;

said interstitial regions comprise an amorphous material selected from the group consisting of said polymers;

said amorphous material includes an additive.

8. A structure according to claim 7, wherein said polymer is an electrically conductive polymer and said polycrystalline material has a conductivity which is isotropic.

9. A structure according to claim 7, wherein said polymer is selected from the group consisting of substituted and unsubstituted polyparaphenylene vinylenes, polythianophthenes, polyparaphenylenes, polyanilines, polythiophenes,

polyazines, polyfuranes, polypyrroles, polyselenophenes, poly-p-phenylene sulfides, polyacetylenes formed from soluble precursors, combinations thereof and blends thereof with other polymers and copolymers of the monomers thereof.

10. A structure according to claim 7, wherein said plasticizer is selected from the group consisting of:

Adipic acid derivatives	Sebacic acid derivatives
Azelaic acid derivatives	Stearic acid derivatives
Benzoic acid derivatives	Succinic acid derivatives
Citric acid derivatives	Sulfonic acid derivative
Dimer acid derivatives	Terpentines
Epoxy derivatives	Terpentine derivatives
Fumaric acid derivatives	Siloxanes
Glycerol derivatives	Polysiloxanes
Isobutyrate derivatives	Ethylene glycols
Isophthalic acid derivatives	Polyethylene glycols
Lauric acid derivatives	Polyesters
Linoleic acid derivative	Sucrose derivatives
Maleic acid derivative	Tartaric acid derivative
Mellitates	Terephthalic acid derivative
Myristic acid derivatives	Trimellitic acid derivatives
Oleic acid derivatives	Glycol derivatives
Palmitic acid derivatives	Glycolates
Paraffin derivatives	Hydrocarbons
Phosphoric acid derivatives	Phosphonic acid derivatives

Phthalic acid derivatives

Polysilanes

Ricinoleic acid derivatives

11. A structure comprising a polyaniline material having a plurality of crystal grains, said material having isotropic electrical conductivity.
12. A structure according to claim 1, wherein the amount of said additive is adjustable.
13. A structure according to claim 12, wherein said amount is controlled to modify physical properties of said structure.
14. A structure according to claim 13, wherein said physical properties are selected from the group consisting of glass transition temperature, compliance, thermal coefficient of expansion, modulus, yield and tensile strength, hardness, density.
15. A structure according to claim 1, wherein said crystallites have a size greater than about 80Å.
16. A structure according to claim 11, wherein said grains are greater than about 80 Å.
17. A structure according to claim 7, wherein said crystallites have a size greater than about 80Å.
18. A structure comprising:

a polycrystalline material comprising crystallites of polyaniline with interstitial regions therebetween;

said polyaniline is selected from the group consisting of a precursors to an electrically conductive polyaniline and an electrically conductive polyaniline;

said interstitial regions comprise an amorphous material selected from the group consisting of polyaniline;

said amorphous material includes an additive in an amount from about 0.001% to about 90% by weight;

said additive is selected from the group consisting of poly-co-dimethylaminopropyl siloxane, poly (ethylene glycol) tetrahydro furfuryl ether, glycerol triacetate and epoxidized soy bean oil.

19. A structure according to claim 1, wherein the amorphous material in the interstitial regions contains crosslinks.
20. A structure according to claim 1, wherein the amorphous material in the interstitial regions are deaggregated.
21. A structure according to claim 1, wherein the additive is removed.
22. A structure according to claim 1, wherein said structure is selected from the group consisting of an electrostatic discharge layer, is a wire, is a solder, is an

electromagnetic interference shield, is a semiconductor device, and a corrosion protection coating.

23. A structure according to claim 1, wherein said amorphous regions have ~~same~~<sup>crystalline</sup> order.

*add A2*